

## **Section 2**

# **Description of the Study Area**

As part of the first task outlined in the master plan, and with the purpose of having the most information possible regarding the area of study, the normality and the operations procedures and functionality of the water and wastewater treatment processes under the responsibility of CESPT, a series of documents and reports were compiled by various governmental agencies, including CESPT. The compilation of these reports is included in Appendix A.

### **2.1 Description of the Study Area**

The area of study is located in the urban zones of the municipalities of Tijuana and Playas de Rosarito, in the Northwest portion of the state of Baja California, Mexico. The city of Tijuana is bordered to the north by the metropolitan area of San Diego, located in the state of California in the United States of America, to the east by Tecate and south by Playas de Playas de Rosarito, which in turn is contiguous to Ensenada in the south.

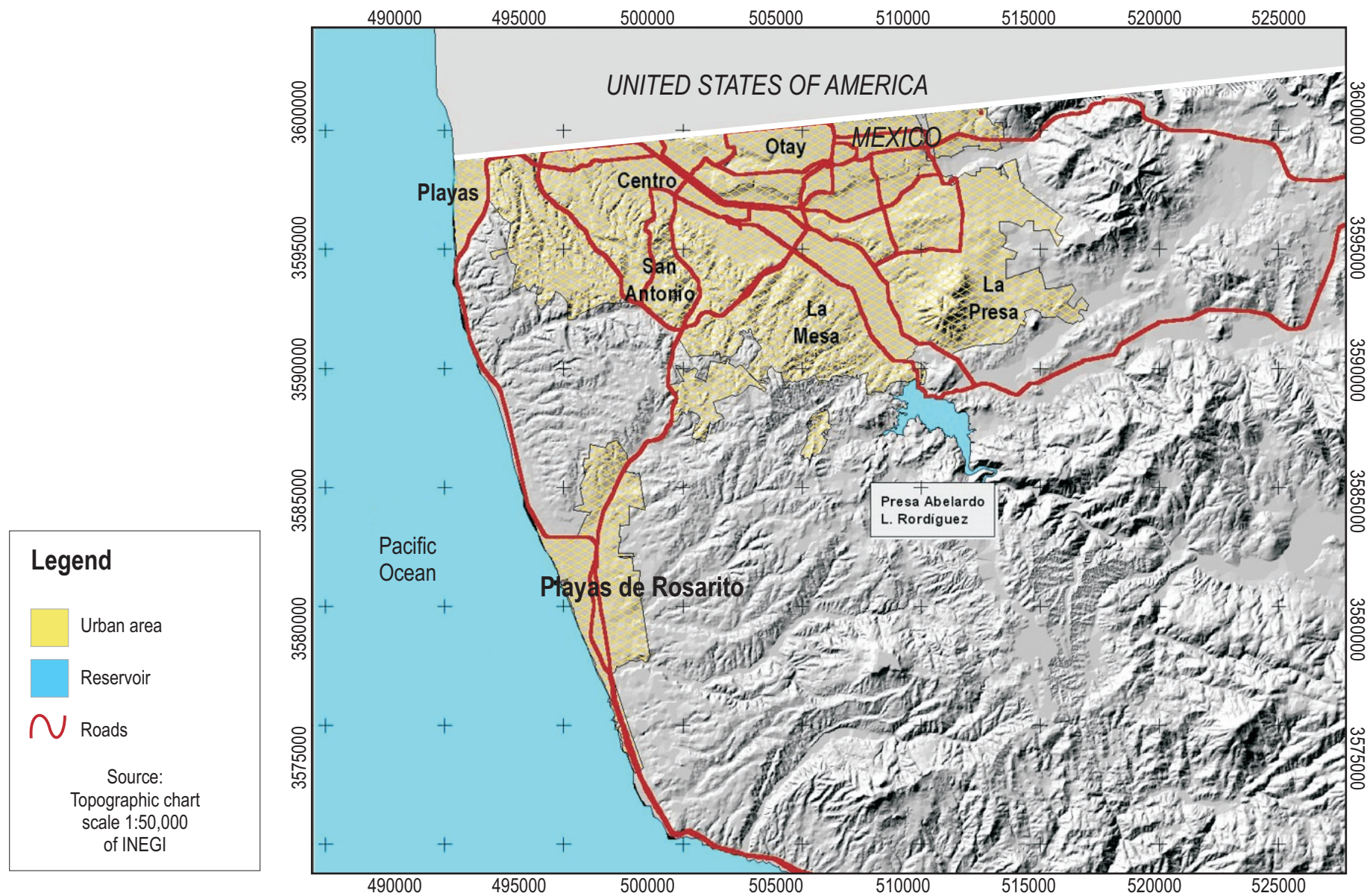
The proximity of the United States, the socio-economic differences between Tijuana and San Diego, and the existence of shared environmental resources, such as the Tijuana River and the Pacific Ocean Coastal Zone provide the region with factors of great importance that must be considered in the production of a master plan.

#### **2.1.1 Geographical and Topographic Characteristics**

The municipality of Tijuana, with a total area of 305,382 acres (123,584 hectares), is located in the northwest of the state of Baja California, within the coordinates of 32° 34' and 32° 22' latitude north; and 116° 35' and 117° 07' longitude west. The municipality is bordered to the north by the United States of America, to the south by the municipality of Playas de Rosarito, to the west by the Pacific Ocean and to the east by the municipality of Tecate. Figure 2-1 illustrates the geographic location and the topography of the area of study.

The orography of Tijuana consists of a series of elevations forming plateaus and hills. Among the most important is Colorado Hill with an elevation of 1,745 feet (532 meters) above mean sea level and San Isidro Hill, with an elevation of 2,690 feet (820 meters) above mean sea level. The slopes and gorges over which the city is built impose problems with settling and consequently elevate the costs of providing basic services. Similarly, these factors create great risks of flooding and slides. Figure 2-2 illustrates a digital model of the elevation of the area of study.

The municipality of Playas de Rosarito has a surface area of 513.3 km<sup>2</sup> and is located to the south of Tijuana. A coastal plane that presents plateaus and staggered hills inland characterizes the orography of Playas de Rosarito. A sandy beach forms the coastal zone with approximately five miles (eight kilometers) in length, which becomes narrower from north to south.

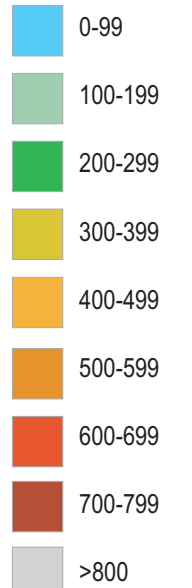


**Figure 2-1**  
Geographic location and topography



**Elevation above  
average sea level  
in meters**

**Legend**

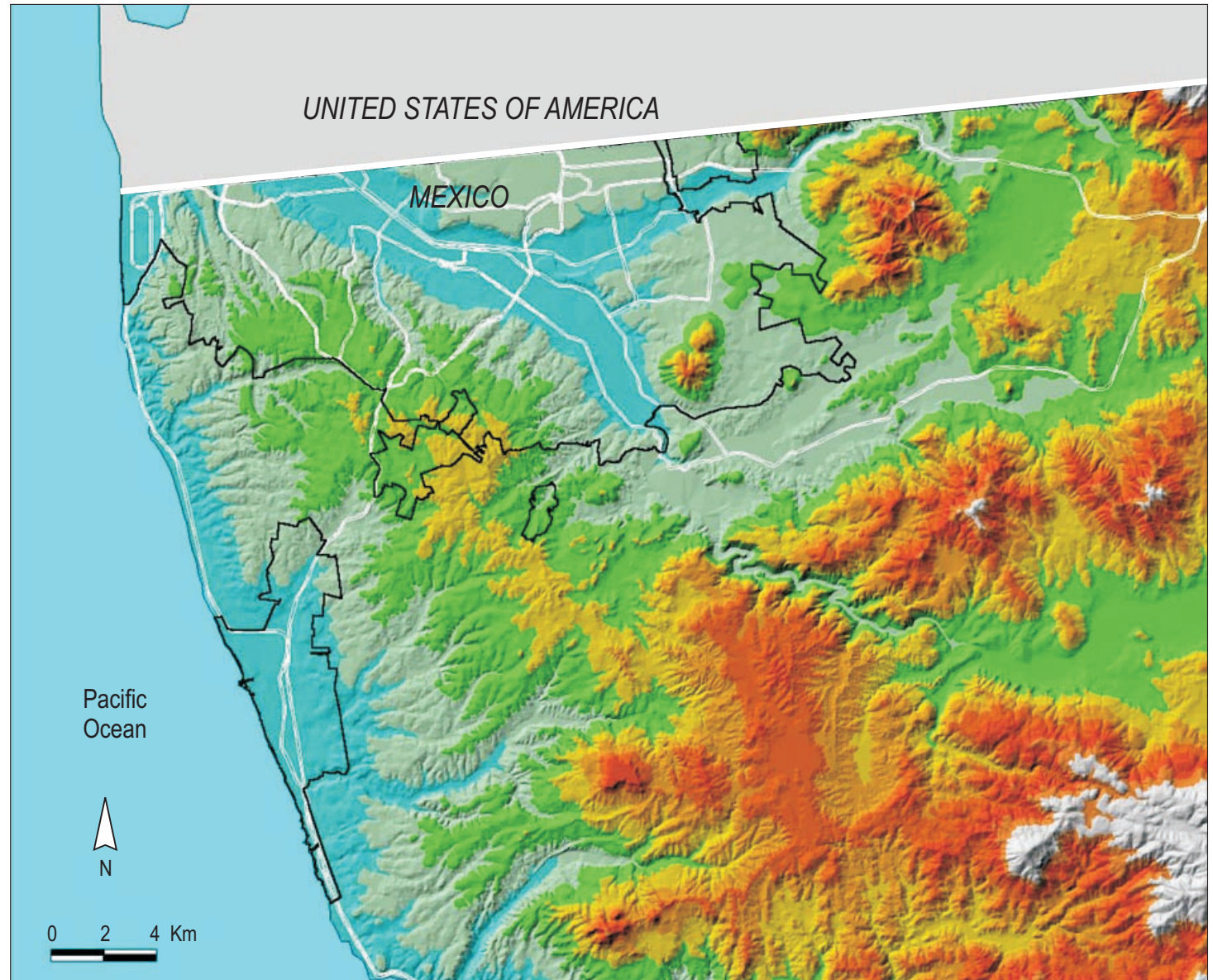


 Urban area

 Roads

Source:

The elevation model is a representation of the x and y orthogonal space of the topographic chart with a scale 1:250,000 of INEGI



### 2.1.2 Topography

Topographic conditions of the area of study limit urban development of the cities, due to the uprising of their hills and gorges. The area of study can be classified based on the slopes of the terrain according to the following:

- Slopes between 0 and 10 percent. These are flat zones adequate for urban development. 40 percent of the urban areas of Tijuana and 53 percent of the urban areas in Playas de Rosarito are located in these types of slopes.
- Slopes between 10 to 20 percent. These are zones with a slight slope, which are considered adequate for urban development. However, these areas suffer from a slight susceptibility to erosion. 21 percent of the urban areas of Tijuana and 31 percent of the urban areas in Playas de Rosarito are located in these types of slopes.
- Slopes between 20 and 30 percent. These areas have strong slopes with a high probability of erosion, which presents certain limitations for urban development, due to the ample erosion potential. Fifteen percent of Tijuana's urban area and 11 percent of Rosarito's urban area are found in this type of terrain.
- Slopes greater than 30 percent. Extreme slopes with a high potential of risk due to the soil instability. These zones are not apt for urban development, since a high level of erosion and slides characterizes them, especially when they are not protected by vegetation, as is the case in some areas of Tijuana. These types of slopes elevate the infrastructure costs and the facilitation of basic services. 23 percent of the urban areas of Tijuana and 5 percent of the urban areas in Playas de Rosarito lie in these types of slopes (Source: SIGEF, COLEF).

Figure 2-3 illustrates the classification of slopes in the area of study.

### 2.1.3 Climate

The climate in the area of study, for both municipalities, is of Mediterranean type, temperate and semiarid with temperatures fluctuating between 35 and 97 Fahrenheit (1.5 and 36 degrees centigrade) for Tijuana, and between 45 and 102 Fahrenheit (7 and 39 degrees centigrade) for Playas de Rosarito.

The average annual precipitation for Tijuana is 9 inches (235 mm) and 11 inches (273 mm) for Playas de Rosarito, with prevailing winds from the southwest to northeast, and 1,696 millimeters of evapotranspiration.

It is pertinent to mention that since the bulk of the urban areas interfere with the natural dynamics of the rainwater flow, the risks and vulnerability of flooding and slides for the population settled along riverbeds will be more frequent.